

**WHAT IS CLAIMED IS:**

1. A bandwidth allocation method for an optical line termination (OLT) in a Gigabit Ethernet passive optical network (GE-PON) having one OLT and a plurality of optical network units (ONUs) coupled to the OLT, the method comprising the steps of:

a) transmitting a registration request grant message for granting an opportunity for transmitting a registration request signal from the OLT to the ONUs;

b) determining the number of ONUs that transmitted registration request messages in response to the registration request grant message; and

c) segmenting a single time slot into a plurality of minislots, segmenting a partial bandwidth of each of the segmented minislots so as to accommodate the ONUs, and allocating the segmented bandwidths to the ONUs that transmitted the registration request messages as voice bands.

2. The bandwidth allocation method of claim 1, wherein the voice bands allocated to the ONUs have the same bandwidth.

3. The bandwidth allocation method of claim 1, further comprising the steps of:

transmitting a band request grant message for granting an opportunity for transmitting a band allocation request signal for data transmission from the OLT to the ONUs;

receiving band allocation request signals from the ONUs in response to the band request grant message; and

dynamically allocating data transmission bands to the ONUs that transmitted the band allocation request signals by performing scheduling for bandwidth allocation according to the band allocation request signals transmitted by the ONUs on every remaining bandwidths excluding the allocated voice bands from each minislot.

4. The bandwidth allocation method of claim 3, further comprising the step of dynamically allocating, upon receiving the band allocation request signals from the ONUs, the data transmission bands to the ONUs that transmitted the band allocation request signals by performing scheduling for bandwidth allocation on a single time slot excluding the allocated voice bands.

5. The bandwidth allocation method of claim 1, wherein the time slot has a bandwidth of a maximum of 2msec.

6. The bandwidth allocation method of claim 1, wherein the minislot has a bandwidth of a maximum of 0.5msec.

7. The bandwidth allocation method of claim 1, wherein in the step c), the single time slot is segmented into a plurality of minislots having the same bandwidth.

8. The bandwidth allocation method of claim 1, wherein in the step c), a partial bandwidth of each of the segmented minislots is segmented into a predetermined number of bands, the predetermined number being identical to the number of the ONUs.